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WATER RESOURCES OF HOWARD COUNTY, MARYLAND

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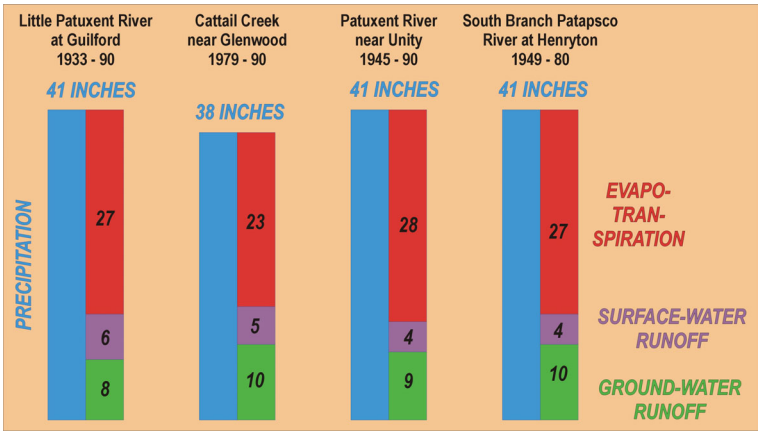
ABSTRACT

Howard County is located in central Maryland between the metropolitan centers of Baltimore and Washington, D.C. The county population increased from 62,394 in 1970 to 187,328 in 1990, and, accompanied by growing commercial and industrial development, has placed an increasing demand on the water resources of the county. This report describes the water resources of Howard County, Maryland.



Ground water is found primarily in joints and fractures of the igneous and metamorphic rocks of the Piedmont physiographic province, within which most of Howard County lies, and in the intergranular spaces of the sediments of the Coastal Plain, which includes the eastern part of the county. Reported yields of more than 2,000 wells in the county range from 2 to 101 gallons per minute in the Coastal Plain, and from 0 (dry hole) to 100 gallons per minute in the Piedmont; reported well depths in the county range from 13 to 750 feet. Transmissivity (estimated from specific capacity) ranges from 165 to 3,453 feet squared per day for 17 Coastal Plain wells, and from less than 1 to greater than 5,000 feet squared per day for 1,760 wells in the Piedmont. The geologic unit in which a well is completed appears to be the most important site factor affecting yield. Water levels fluctuate through a range inversely proportional to overburden thickness. The water is generally acidic, but chemical concentrations are mostly within safe drinking-water criteria. Radon concentrations in ground water range from less than 80 to 40,000 picoCuries per liter.

Thirty-two stream basins that range in area from 0.54 to 285 square miles were studied. Streamflow characteristics were determined for 11 gaging stations with continuous records of flow. Mean annual streamflows range from 23.9 to 412 cubic feet per second (ft^3/s), 100-year peak flows range from 10,400 to 181,000 ft^3/s, and 7-day, 10-year low flows range from 2.8 to 11 ft^3/s. Peak flows at three gaging stations in Howard County were simulated with the HEC-1 rainfall-runoff model; at a 100-year recurrence interval, flows ranged from 6,820 to 15,700 ft^3/s for a rainfall duration of 24 hours. Quality of stream water during base flow is similar to quality of ground water adjacent to the stream. Eight pesticides, DDD and DDE, polychlorinated biphenols (PCB), and 9 trace elements were detected in stream-bottom materials, but 11 other organic compounds were undetected.

The average annual hydrologic budget for that portion of Howard County located in the Piedmont Province is precipitation (42 inches) equals overland runoff (5 inches) plus ground-water runoff (9 inches) plus evapotranspiration (28 inches).

Also available from Maryland Geological Survey:

Basic Data Report No. 19: Hydrologic Data for Howard County, Maryland, compiled by James R. Dine, James C. Adamski, and Michael D. Tompkins (1992).

Quadrangle Atlas No. 21: Hydrogeologic Atlas, Ellicott City Quadrangle, by Mark T. Duigon (1983).

Quadrangle Atlas No. 24: Hydrogeologic Atlas, Sykesville Quadrangle, by Mark T. Duigon, Michael D. Tompkins, and Barbara F. Cooper (1995).

Quadrangle Atlas No. 25: Hydrogeologic Atlas, Woodbine and Damascus Quadrangles, by Mark T. Duigon, Michael D. Tompkins, and Barbara F. Cooper (1995).

Quadrangle Atlas No. 26: Hydrogeologic Atlas, Clarksville and Sandy Spring Quadrangles, by Mark T. Duigon, Michael D. Tompkins, and Barbara F. Cooper (1995).

Report of Investigations No. 45: Simulation of Ground-Water Flow and Base Flow in Weathered Crystalline Rock, Upper Cattail Creek, Howard County, Maryland, by R.E. Willey and Grufron Achmad (1986).